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Department of Energy

Idaho Operations Office
850 Energy Drive
Idaho Falls, Idaho 83401-1563

May 8, 2001

Mr. Wayne Pierre, Team Leader
Environmental Cleanup Office
U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101

Mr. Dean Nygard, Site Remediation Program Manager
Idaho Department of Environmental Quality
Waste Management and Remediation Program
1410 N. Hilton
Boise, Idaho 83706

SUBJECT: Transmittal of the Operable Unit (OU) 5-05 Stationary Low Power (SL)-1 Burial Grounds and OU 6-01 Boiling Water Reactor Experiment (BORAX)-I Buried Reactor Annual Inspection Report - (EM-ER-01-077)

Dear Mr. Pierre and Mr. Nygard:

This letter transmits copies of the OU 5-05/6-01 Annual Inspection Report. This report satisfies the requirement for conducting an annual inspection as described in the OU 5-05/6-01 Operations and Maintenance Plan of the Final Remedial Action Report for OU 5-05/6-01.

The engineered barriers are performing as designed with no evidence of erosion, cover intrusion or movement. Fencing, signs and protective barriers are proving adequate to secure the two sites.

If you have any questions or comments regarding this document, please contact Carol Hathaway at 208-526-4049 or myself at 208-526-4392.

Sincerely,

Kathleen E. Hain

Kathleen E. Hain, Director
Environmental Restoration Division

Enclosure

cc: Rick Poeton, EPA, 1200 Sixth Avenue, Seattle, WA 98101; 2 copies
Ted Liveratos, IDHW DEQ; 2 copies
Tim Safford, MS 4160, 1 copy

OU 5-05, SI-1 Burial Ground and OU 6-01, BORAX-I Buried Reactor 2001 Annual Inspection Summary

1. GENERAL

The site-specific Operation and Maintenance Plan (INEEL 1997) requires annual inspections of the Stationary Low-Power Reactor No. 1 (SL)-1 and the Boiling Water Reactor Experiment (BORAX)-I engineered barriers, designated as Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites Auxiliary Reactor Area (ARA)-06 (Operable Unit [OU] 5-05) and BORAX-02 (OU 6-01), respectively. On April 17, 2001, the two sites were visually inspected to determine if any areas were affected by erosion or subsidence and to identify missing or damaged institutional controls. Inspection of the revegetated areas for proper growth was only required for a three-year period after the completion of the remedial actions, ending in the fall of 2000; however, observations and notes were made regarding the vegetative cover at the two sites. Checklists were used during the inspections to document the inspection findings and are included in Attachment 1 of this summary report. Photographs were taken of both the SL-1 and BORAX-I sites at the time of the inspections and are included in Attachment 2. Radiological surveys of both sites were conducted on March 29, 2001, to verify that radiation levels were consistent with the previous years' exposure levels. Attachment 3 includes the results of the radiological surveys.

During the year 2000, there were multiple range fires that burned portions of the Idaho National Engineering and Environmental Laboratory (INEEL). Two of these fires burned in the general areas of the SL-1 and BORAX-I sites; therefore, evaluations of the distances of closest approach to the SL-1 and BORAX-I sites were made. Range fires do not pose threats to the integrity of the engineered barriers at either the SL-1 or BORAX-I sites; however, a fire break was cut around the ARA-23 site, which encompasses the SL-1 burial ground, as a precautionary measure. Radiological contamination in soils and plants surrounding the SL-1 site pose an airborne contamination hazard if burned.

This report contains four attachments that complement the specific inspection items in the following sections. The attachments are as follows:

- Attachment 1 2001 Annual Inspection Checklists and Site Maps
- Attachment 2 2001 Annual Inspection Photographs
- Attachment 3 2001 Annual Inspection Radiological Survey Reports
- Attachment 4 Fire Maps.

The 2001 annual inspection is the sixth round of monitoring and maintenance activities for the SL-1 and BORAX-I sites and marks the end of the first five-year period from the start of the remedial action in July 1996. Subsequently, the first five-year review is planned for completion in fiscal year (FY) 2001. Based upon the results of the five-year review, the frequency of inspections may decrease, and the responsibility of conducting the inspections at the BORAX-I site will be turned over to Waste Area Group (WAG) 10 in FY 2002. Annual inspections of the SL-1 site will continue under the purview of the WAG 5 Comprehensive Operation and Maintenance Plan (INEEL 1997) until the Comprehensive Record of Decision (DOE-ID 2000) has been completely implemented and the first five-year review has been successfully completed. At that time, the administrative maintenance of the institutional controls listed in the WAG 5 Comprehensive Record of Decision will be integrated into the administrative authority of WAG-10.

2. ENGINEERED BARRIERS

The engineered barriers at both the SL-1 and BORAX-I sites were visually inspected for evidence of subsidence, erosion, intrusion or other conditions that would indicate that the integrity of the barriers had been compromised. It was noted that the barriers at both sites appeared intact with no visible evidence of subsidence or erosion. There was no noticeable animal or insect intrusion into the barriers; however, two anthills were observed inside the perimeter fence, external of the barrier at BORAX-I. All inspection items indicate that the integrity and effectiveness of the barriers remain intact. Attachments 1 and 2 detail the inspection results.

3. REVEGETATED AREAS

The revegetated areas at both sites were visually inspected for evidence of erosion. There were no visual indications of soil movement, pedestalling of plants or rocks, rills, gullies, or other modes of erosion. Although not required for the year 2001 annual inspection, a qualitative assessment of the vegetative cover was also performed. There was no indication of encroachment of weeds or shrubs onto the engineered barriers, and the new spring growth grass appeared to be well established. The results of the inspection of the revegetated areas are included in Attachments 1 and 2.

4. INSTITUTIONAL CONTROLS

The institutional controls at both the SL-1 and BORAX-I sites consist of CERCLA signage, permanent markers, fences, and radiological postings. As indicated on the site maps in Attachment 1, the institutional controls at both sites were all found in place and intact with the following exception:

- BORAX-I The BORAX-02 CERCLA sign needs to be updated. The present perimeter fence size is 48 × 51 m (158 × 165 ft), while the CERCLA sign has the preremedial action dimensions of 30 × 30 m (100 × 100 ft).

Attachment 2 includes photographs of the sites and the institutional controls in place at each site.

5. RADIOLOGICAL SURVEY

Radiological surveys were conducted around the perimeters of the engineered barriers at both sites. A radiological control technician performed the surveys on March 29, 2001, with a Bicron μR survey meter, and the results are shown in Attachment 3. The surveys were performed inside the perimeter fences using the hand-held instrumentation at waist height. The dose rates at the SL-1 site ranged from 10 to 15 μR/hr, while the dose rates around the perimeter of the BORAX-I barrier were 10 μR/hr. These exposure rates are consistent with past survey results, which have ranged from 10 to 30 μR/hr at SL-1 and averaged 10 μR/hr at the BORAX-I site.

6. RANGE FIRES

As mentioned previously, there were multiple range fires at the INEEL during the summer/fall of 2000. Two of the range fires were in the general areas of the SL-1 and BORAX-I sites; however, no fires actually burned any portion of either site. Evaluations were made of the distances of closest approach of the fires to the SL-1 and BORAX-I sites. A range fire that occurred on September 18, 2000, in the vicinity of the Power Burst Facility and the Auxiliary Reactor Area had a distance of closest approach of 3.6 kilometers (2.22 miles) from the SL-1 site. As part of the fire fighting efforts, a firebreak was cut

around the perimeter of the ARA-23 CERCLA site, which encompasses the SL-1 burial ground; however, the burial ground was not disturbed during these mitigation efforts. Attachment 2 includes a photograph of the new firebreak and the SL-1 burial ground.

A range fire that started northwest of the Radioactive Waste Management Complex on September 27, 2000, had a distance of closest approach of 2 kilometers (1.25 miles) from the BORAX-I site. Attachment 4 includes maps of the fire boundaries proximal to the SL-1 and BORAX-I sites.

7. CONCLUSIONS

The engineered covers for both the SL-1 and BORAX-I sites appear to be performing as designed with no visual evidence of subsidence, erosion or intrusion. Institutional controls at the sites including fencing, signage, and protective barriers appear to be effective in securing the site against unauthorized human intrusion. The revegetation effort appears to have been successful as evidenced by the coverage of perennial grasses and the absence of weeds or shrubs.

8. REFERENCES

DOE-ID, 2000, *Final Record of Decision for Power Burst Facility and Auxiliary Reactor Area*, U.S. Department of Energy Idaho Operations Office, January.

INEEL, 1997, *Stationary Low-Power Reactor-1 and Boiling Water Reactor Experiment-I Burial Grounds Engineered Barriers Project Operation and Maintenance Plan, Operable Units 5-05 and 6-01*, INEL-95/0652, Revision 0, Idaho National Engineering and Environmental Laboratory, July.

Attachment 1

2001 Annual Inspection Checklists and Site Maps

INSPECTION REPORT FORM FOR SL-1 BURIAL GROUND ENGINEERED BARRIER
AS REQUIRED BY OU 5-05 OPERATING AND MAINTENANCE PLAN

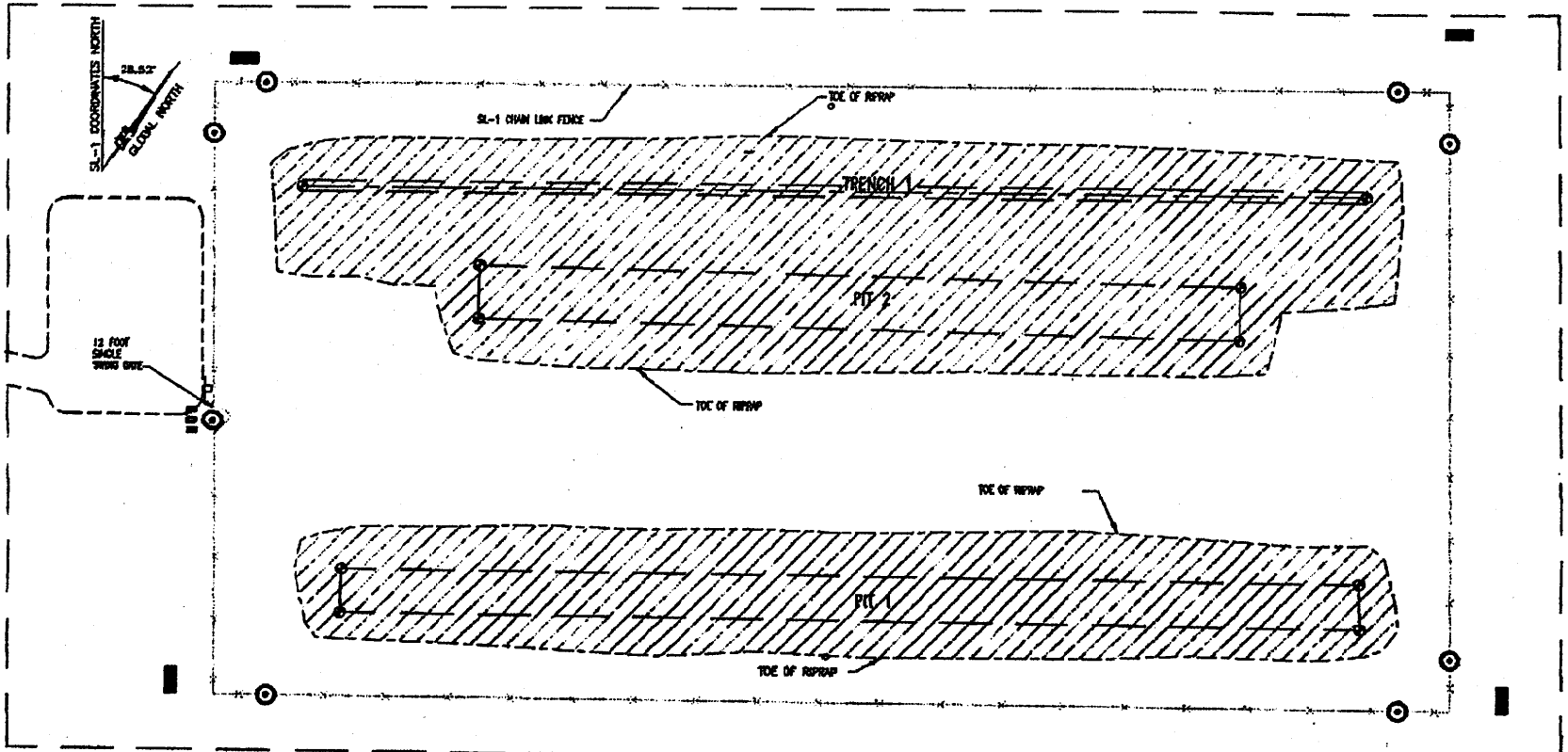
☐ SEMI-ANNUAL ☒ ANNUAL Inspection of SL-1 Barrier

INSPECTION ACTIVITY	INSPECTOR SIGNATURE	INSP. DATE	COMMENTS/RECOMMENDED REPAIR
REVEGETATED AREAS			
1. Inspect for non growth areas	John R. Giles	April 17, 2001	Vegetation; specifically grasses, cover the area well. There does not appear to be any encroachment by weeds or shrubs. New growth appears to be well established.
2. Inspect for sparse growth areas.	John R. Giles	April 17, 2001	
3. Inspect for weed encroachment	John R. Giles	April 17, 2001	
RIPRAP BARRIER			
1. Inspect for erosion areas	John R. Giles	April 17, 2001	No visual evidence of erosion, subsidence or slope movements of the barriers, or areas adjacent to the barriers. Radiological survey performed indicated that gamma-dose rates ranged from 10 to 15 µR/hr and are consistent with previous survey results. Radiological postings are in place.
2. Inspect for subsidence areas.	John R. Giles	April 17, 2001	
3. Survey for slope movement (yearly).	John R. Giles	April 17, 2001	
4. Rad survey.	John R. Giles	March 29, 2001	
INSTITUTIONAL CONTROLS			
1. Document that fences restrict access.	John R. Giles	April 17, 2001	Fences, signs, barriers, and access points are all in place and appear to be effective in restricting access.
2. Document that signs/barriers are in place and in good condition.	John R. Giles	April 17, 2001	

Name of Inspector John R. Giles

Photographs Taken ☒ Yes ☐ No

Qualifications/Title Technical Task Lead/Senior Scientist



LEGEND:

- ACCESS ROADS/PARKING AREA
- CHAIN LINK FENCE
- PERMANENT MARKER
- 12 FOOT SINGLE SWING GATE
- TOE OF RIPRAP
- KEEP OUT WARNING SIGN
- CONTAMINATION/RADIATION SIGN (ON GATE)
- RIPRAP AREA
- CERCLA SIGN

NOTE:
REFERENCE DRAWING NO. RIPSLIP2

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)

BBWI IDAHO LLC

SL-1 ENGINEERED BARRIER

SIZE AS SHOWN

1 of 1

INSPECTION REPORT FORM FOR BORAX-I ENGINEERED BARRIER
AS REQUIRED BY OU 6-01 OPERATING AND MAINTENANCE PLAN

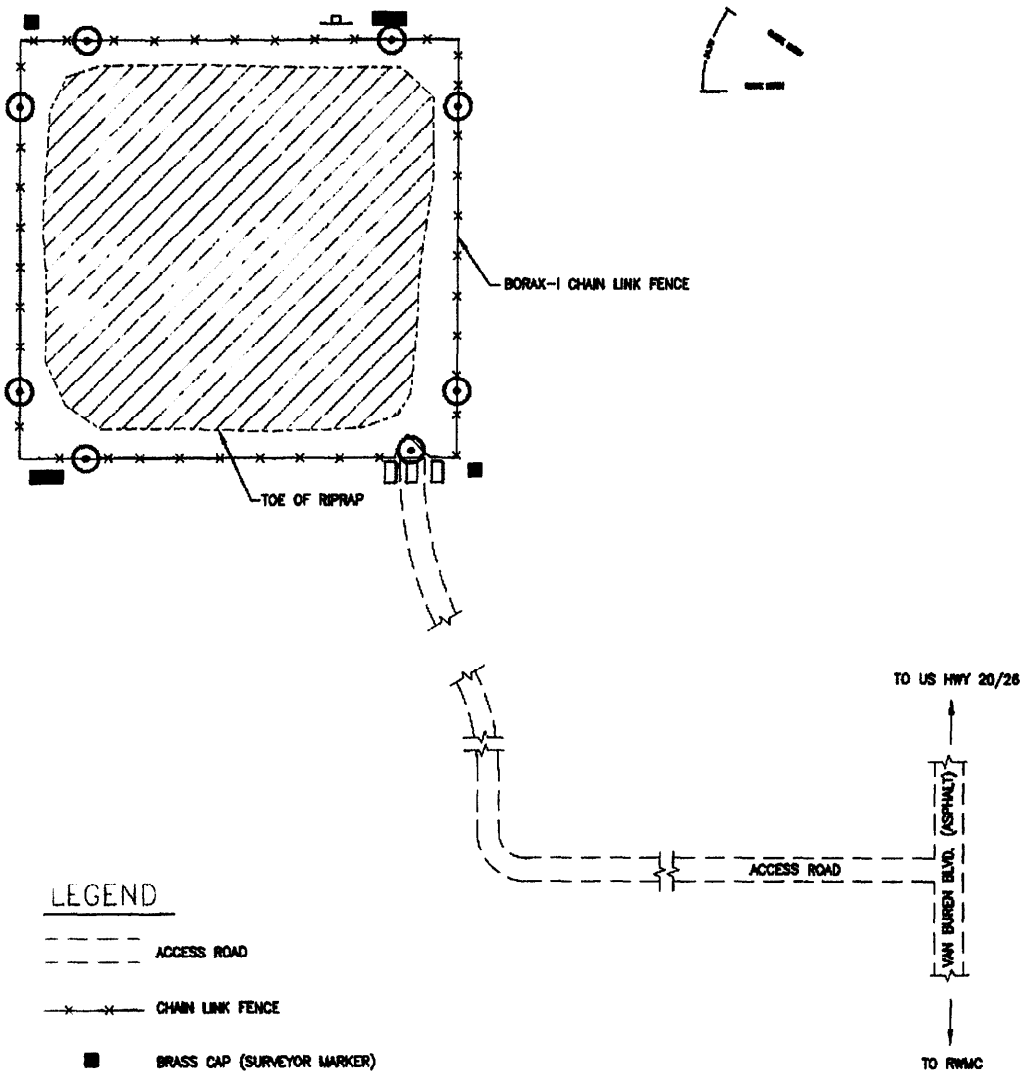
☐ SEMI-ANNUAL ☒ ANNUAL Inspection of BORAX-I Barrier

INSPECTION ACTIVITY	INSPECTOR SIGNATURE	INSP. DATE	COMMENTS/RECOMMENDED REPAIR
REVEGETATED AREAS			
1. Inspect for non growth areas	John R. Giles	April 17, 2001	Vegetation; specifically grasses, cover the area well. There does not appear to be any encroachment by weeds or shrubs. New growth appears to be well established.
2. Inspect for sparse growth areas.	John R. Giles	April 17, 2001	
3. Inspect for weed encroachment	John R. Giles	April 17, 2001	
RIPRAP BARRIER			
1. Inspect for erosion areas	John R. Giles	April 17, 2001	No visual evidence of erosion, subsidence or slope movements of the barriers, or areas adjacent to the barriers. Two anthills were noticed inside the perimeter fence, external to the barrier.
2. Inspect for subsidence areas.	John R. Giles	April 17, 2001	
3. Survey for slope movement (yearly).	John R. Giles	April 17, 2001	
4. Rad survey.	John R. Giles	March 29, 2001	Radiological survey performed indicated that gamma dose rates were 10 μR/hr around the barrier and are consistent with previous survey results. Radiological postings are in place.
INSTITUTIONAL CONTROLS			
1. Document that fences restrict access.	John R. Giles	April 17, 2001	Fences, signs, barriers, and access points are all in place and appear to be effective in restricting access.
2. Document that signs/barriers are in place and in good condition.	John R. Giles	April 17, 2001	

Name of Inspector John R. Giles

Photographs Taken ☒ Yes ☐ No

Qualifications/Title Technical Task Lead/Senior Scientist



LEGEND

- ACCESS ROAD
- CHAIN LINK FENCE
- BRASS CAP (SURVEYOR MARKER)
- PERMANENT MARKER
- 12 FOOT SINGLE SWING GATE
- TOE OF RIPRAP
- KEEP OUT WARNING SIGN
- CONTAMINATION/RADIATION AREA SIGN (ON GATE)
- RIPRAP AREA
- CERCLA SIGN

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)

NOTE:
REFERENCE DRAWING NO. RRTPOBOR

BBWI IDAHO LLC

BORAX-I ENGINEERED BARRIER

SIZE	IDENT CODE NUMBER AREA	TYPE	CL	ORG	DRAWING NO.	REV	SHEET NO.
SCALE: AS SHOWN					SPEC CODE		1 OF 1